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USACE / NAVFAC / AFCEA / NASA          UFGS-01 32 16.13 26 (July 2006)
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Preparing Activity: NAVFAC             Superseding
                   NAVFAC Southwest    UFGS-01 32 16.13 26 (March 2001)
                                           Use in lieu of
                                           UFGS-01 32 16.00 20

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UNIFIED FACILITIES GUIDE SPECIFICATIONS

Use for NAVFAC Southwest projects only

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07/06

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SECTION 01 32 16.13 26

NETWORK ANALYSIS SCHEDULES

07/06

NOTE: This Specification Section covers the preparation and use of a contractor prepared Network Analysis Schedules which is required when one or more of the following conditions exist:

1. The Contract Construction cost is expected to exceed \$500,00
2. The Contract duration is over 180 days
3. The Contract is Phased
4. The Contract has environmental schedule restrictions
5. The Contract has any other requirements or schedule restrictions that would warrant the imposition of this section. Check with ROICC personnel.

This requirement may be waived when only conditions 1 and 2 exist if ROICC personnel request it due to the straightforward nature of the project.

PART 1 GENERAL

1.1 DESCRIPTION

Pursuant to the clause entitled "FAR 52.236-15, Schedules for Construction Contracts" prepare a Network Analysis System (NAS) as described below. The Network Analysis System shall be the basis for measuring the Contractor's progress. Lack of an approved NAS shall result in an inability of the Contracting Officer to evaluate the Contractor's progress for the purposed payment. Failure of the Contractor to comply with the requirements specified in this section shall result in the disapproval of the entire schedule submission and all work except that specified in Section 01 45 00.00 20 paragraph entitled "Preliminary Work Authorized Prior to Approval" will not proceed.

1.2 SUBMITTALS

NOTE: The "G" in submittal tags following each submittal item indicates Government approval and should be retained. Add "G" in submittal tags tokens following any added submittals that are determined to require Government approval. Submittal items not designated with a "G" will be approved by the QC organization.

Submit the following in accordance with Section 01 33 0 SUBMITTAL PROCEDURES. Submit hard copies and electronic copies of all network analyses and updates. Electronic copy shall be on 3.25 inch double sided, high density floppy disks. The network analysis system shall be kept current, with changes made to reflect the actual progress and status of the construction. Updated electronic and hard copies shall be provided as directed.

SD-11 Closeout Submittals

[Preliminary network; G]

Network Analysis system; G

Monthly reports

1.3 SOFTWARE

The network analysis software shall be capable of running on a Government owned IBM compatible personal computer. The same software shall be used to produce the diagram and the mathematical analysis.

[The software used in making the schedule and mathematical computation shall be capable of compiling the total value of completed and partially completed activities. The program shall also be capable of accepting revised completion dates as modified by approved time extensions and recomputation of tabulation dates/costs and float accordingly.]

1.4 NETWORK ANALYSIS SYSTEM FORMAT

The system shall consist of time scaled network logic diagrams and accompanying mathematical analyses. Facilities with discrete completion dates shall be identified by separate subnetworks interconnected with the basic diagram. In addition to construction activities, detailed network activities shall include the following:

- a. Utility interruptions
- b. Submittal and approval of materials, samples, delivery of O&M manuals, training to be provided, shop drawings, and the procurement of material and equipment.
- c. Receipt of materials for which payment will be requested in advance of installation.
- d. Fabrication of special material and equipment, and their

installion and testing.

- e. Activities that impact facility occupants.
- f. Activities of the Government that affect progress and contract-required dates for completion of all or parts of the work, including Government furnished materials and equipment, and specified Government inspections.

1.4.1 Diagrams

Provide network diagram on a single 22 x 34 inch sheet or metric equivalent, unless otherwise approved. Compress Time Scale and group activities together as required to fit. Updated diagrams shall show the date of the latest revision. Show the order and interdependence of activities and the sequence in which the work is to be accomplished as planned. The basic concept of a network analysis diagram will be followed to show how the start of a given activity is dependent on the completion of preceding activities and how its completion restricts or restrains the start of following activities. The diagram shall clearly show the activities of the critical path. Show the following information on the diagrams for each activity:

- a. Activity number
- b. Description of the activity
- c. Duration in work days
- d. Responsibility code indicating the party responsible for accomplishment of the activity. As a minimum, provide a separate responsibility code for each specification section.
- e. Area code indicating the area of the project in which the work will be performed.
- f. Category of Work code which describes the activity, such as Administrative, Submittal, Procurement, Work Activity, Testing, etc.
- g. Phase of Work Code. Work activities shall not contain work in more than one phase of work.
- h. Activies shall be grouped by the code(s) that graphically show(s) the order and interdependence of activities and the sequence in which the work is to be accomplished.

1.4.2 Activity Durations and Numbering

All activities with a monetary value shall have durations equal to or less than 30 calender days. Failure to develop or update the Network Analysis System at the appropriate level of detail, as specified by the Contracting officer, shall result in the disapproval of the NAS. Numbering shall be assigned so that, in general, predecessor activity numbers are smaller numerically than the successor activity numbers. Skip numbering shall be used on the network to allow insertion of additional activities for contract modifications and logic changes.

[1.4.2.1 HVAC TAB Activities

Requirements for the activities related to HVAC TAB work, Section 23 08 00.00 20 HVAC TESTING/ADJUSTING/BALANCING, are specified in NAVFAC Southwest Section 01 20 00.00 26 PRICE AND PAYMENT PROCEDURES.

]1.4.3 Mathematical Analysis

The network diagram mathematical analysis shall include a tabulation of each activity shown on the detailed network diagrams. In addition to the information required by paragraph entitled "Diagrams." Provide the following information as a minimum for each activity:

- a. Earliest start date (by calendar date)
- b. Earliest finish date (by calendar date)
- c. Actual start date (by calendar date)
- d. Actual finish date (by calendar date)
- e. Latest start date (by calendar date)
- f. Latest finish date (by calendar date)
- g. Total float or slack
- h. Monetary value of activity - values of activities will be broken down and listed by material, equipment, and labor costs,
- i. Manpower required (crew size)
- j. Percentage of activity completed
- k. Contractor's earnings based on portion of activity completed

[1.4.4 Additional Requirements

 NOTE: Select this option when Construction Categories are specified in Section 01200, "Price and Payment Procedures."

 NOTE: The information required by these items is optional and is seldom needed for routine work. It should only be specified on large and complex projects with critical completion dates. Manpower and equipment loading schedules are of primary importance to the Contractor in deciding the most efficient use of personnel resources and optimizing equipment usage. Since these decisions are the responsibility of the Contractor's management process, the information value to the Contracting Officer is in assuring that adequate manpower and equipment is being supplied throughout the course of the project.

In addition to the tabulation of activities, the computation will include the following data:

- a. Identification of activities which are planned to be expedited by use of overtime or double shifts to be worked, including Saturdays, Sundays and holidays including dates of notification.
- b. On-site manpower loading schedule
- c. A description of the major items of construction equipment planned for operations of the project. The description shall include the type, number of units, and unit capacities. Provide a schedule showing proposed time equipment will be on the job keyed to activities on which equipment will be used.

]1.4.5 Required Sorts

List the activities in sorts or groups as follows:

- a. By the amount of total float, from lowest to highest and then in order of activity number (Total Float or Slack Report) showing all incomplete activities
- b. Contractor's monthly payment request sorted by responsibility code with summary (cost earned by Responsibility Code Report)
- c. Early Start Report
- d. Listing of new input data that generates each update, such as percent complete and actual start and end dates.

NOTE: Select this option when Construction Categories are specified in Section 01200, "Price and Payment Procedures."

[e. Construction Categories]

1.5 SUBMISSION AND APPROVAL

1.5.1 Preliminary Meeting

If requested by the Contracting Officer, participate in a preliminary meeting to discuss the proposed schedule and requirements of this section prior to submission of the network.

[1.5.2 Preliminary Network

NOTE: This paragraph should only be used on complex contracts. CHECK WITH ROICC PERSONNEL.

Submit a preliminary network defining the planned operations during the first [90] [_____] calendar days after contract award. Submit the Preliminary Network within [20] [_____] days after contract award. The general approach for the balance of the project shall be indicated. Cost

of activities expected to be completed or partially completed before submission and approval of the whole schedule should be included. Submit three copies of both the preliminary network diagrams and required sorts listed in paragraph entitled "Required Sorts." In accordance with paragraph entitled "Monthly Reports," the preliminary network may be used for requesting progress payments for a period not to exceed 90 calendar days after receipt of "Contract Award." Payment requests after the first 90 calendar day period shall be based upon the complete network.

]1.5.3 Completed Network

Submit the complete network analysis, consisting of the network mathematical analysis and network diagrams, within 40 [_____] calendar days after contract award. Submit three copies of both the diagrams described in paragraph entitled "Diagrams," the required sorts listed in paragraph entitled "Required Sorts," and the Look-Ahead Report defined in paragraph entitled "Monthly Reports." Submit one electronic copy of the NAS as described in the paragraph entitled "Submittals."

1.5.4 Review and Evaluation

The Contractor shall participate in a review and evaluation of the proposed network diagrams and analysis by the Contracting Officer. Revisions necessary as a result of this review shall be resubmitted for approval of the Contracting Officer within 10 calendar days after the conference. The approved schedule shall then be the schedule to be used by the Contractor for planning, organizing, and directing the work, reporting progress, and requesting payment for work accomplished.

1.5.5 Contractor Changes to the Network Analysis Schedule

If changes in the method of operating and scheduling are desired, the Contracting Officer shall be notified in writing stating the reasons for the change. If the Contracting Officer considers these changes to be of a major nature, the Contractor may be required to revise and submit for approval, without additional cost to the Government, network diagrams, required sorts, and the Look-Ahead Report. Changes which affect activities with adequate time shall be considered a major change when their cumulative effect could extend the contract completion date.

1.5.6 Monthly Reports

Submit at monthly intervals a report of the actual construction progress by updating the required sorts and the time scaled logic diagram. Initially, and monthly thereafter, produce a Look-Ahead report. The Look-Ahead Report shall include scheduled activities to be started, in process or completed during the upcoming reporting period, sorted by early start then activity number. At the end of the reporting period, Contractor and Government representatives shall jointly make entries on the Look-Ahead Report for the preceding reporting period to show actual progress. As a minimum, the following action will be accomplished:

- a. Identify the Actual Start and Actual Finish Date for each activity currently in-progress or completed.
- b. Identify the estimated Remaining Duration for each activity in-progress.
- c. Indicate percentage of cost payable for each activity

d. Indicate changes in the network diagram

Contract modifications and other schedule issues shall be shown on the update report. Submit a narrative report describing current and anticipated problem areas and/or delaying factors with their impact together with an explanation of corrective actions taken or proposed. Produce, from the marked-up Look-Ahead Report, updated required sorts for the project and use the accumulated cost for completed and partially completed activities as the basis for requesting progress payments, pursuant to, "FAR 52.232-5, Payments Under Fixed-Price Construction Contracts" and "FAR 52.236-5, Schedules for Construction Contracts." Contract status shall be evaluated on the basis of relative float on the critical path at the time of updating with negative relative float indicating the contract is behind schedule and positive relative float indicating status ahead of schedule. (Relative float is the current status of an activity in relation to the approved schedule completion date.) Submit three copies of the required sorts listed in paragraph entitled "Required Sorts," one copy of the diagram described in paragraph entitled "diagrams," one copy of the Look-Ahead Report for the upcoming period, along with one copy of the previously marked-up Look-Ahead Report with each payment request, and one electronic copy as described in "Submittal Procedures."

1.6 TIME EXTENSIONS

Float or slack is defined as the amount of time between the early start date and the late start date, or the early finish date and the late finish date of any of the activities in the NAS. Float or slack is not time for the exclusive use or benefit of either the Government or the Contractor. Extension of time for performance required under the clauses entitled "Changes," "Differing Site Conditions," "Default (Fixed-Price Construction)" or "Suspension of Work" of the Contract Clauses will be granted only to the extent that equitable time adjustments for the activity or activities affected exceed the total float along with the network paths involved. Time Extension requests shall include as minimum:

- a. A narrative report supporting the request.
- b. A sub-network of the affected activities
- c. An analysis of the overall impact of the proposed change.

1.7 CONTRACT MODIFICATION

When a contract modification to the work is required, submit proposed revisions to the network and proposed time extensions reflecting the impact. Submit the proposed network revisions with the cost proposal for each proposed change. Incorporate contract modifications into the subsequent monthly update. Financial data shall not be incorporated until issuance of a contract modification on standard form 30 signed by the Contracting Officer. Those contract modifications determined to have no impact will require only the identification of the affected activities as part of the proposed change proposal.

1.8 MONTHLY COORDINATION MEETING

NOTE: Consult with the local ROICC on whether to

use this paragraph. Include this paragraph for larger or more complex projects.

In conjunction with receipt of the Monthly Report, a coordination meeting will be held each month [on site] [in the Contracting Officer's conference room] to discuss the report. The Contractor shall make a presentation of the previously submitted Monthly Report to the Contracting Officer so as to provide an overview of the project's schedule and provide an opportunity to discuss items of coordination.

[1.9 BIWEEKLY WORK SCHEDULE

NOTE: Consult with the local ROICC on whether to use this paragraph. Include this paragraph for larger or more complex projects.

To provide a more detailed day-to-day planning of upcoming work, the Contractor shall prepare and issue detailed work plans which coordinate with and supplement the above defined network analysis. The work plans shall be keyed to the NAS activity numbers and shall be submitted each week and shall show the projects activities which will occur during the following two-week interval. Additionally, the critical path activities are to be identified on the biweekly work plan. The detail work plans are to be in sufficient detail to define the work to be accomplished, the crews, construction tools and equipment to be used during the next two-week interval. The work plan shall be formatted to allow reproduction on 8 1/2 by 11 sheets. Three copies of the bar chart schedules shall be delivered to the Contracting Officer not less than 3 work hours prior to the start of the weekly coordination meeting.

] [1.10 WEEKLY COORDINATION MEETING

NOTE: Consult with the local ROICC on whether to use this paragraph. Include this paragraph for larger or more complex projects.

In conjunction with the receipt of the Bi-Weekly detail Work Plan, a coordination meeting will be held each week [on site] [in the Contracting Officer's conference room] to discuss the work plan. The Contractor shall make a presentation of the previously submitted Bi-Weekly Plan to the Contracting Officer so as to provide an overview of the project's schedule and provide an opportunity to discuss items of coordination. Consideration of materials, crews, and equipment shall be addressed to ascertain their respective availability. The meeting shall identify actions necessary to provide adherence to the bi-weekly plan and the overall network for the project defined above. Meeting minutes shall be taken by the Contractor. Within one day of the meeting, the Contractor will provide a draft copy of the meeting minutes to the Contracting Officer for review and comment. Final copies of the minutes will be issued within 3 days of the meeting.

] PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

NOTE: Suggestions for improvement of this specification will be welcomed using the Navy "Change Request Forms" subdirectory located in SPECSINTACT in Jobs or Masters under "Forms/Documents" directory or DD Form 1426. Suggestions should be forwarded to:

Commanding Officer
Naval Facilities Engineering Command
Southwest Division, Code 0406, Specifications
1220 Pacific Highway
San Diego, CA 92132-5190

-- End of Section --